



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,109	06/24/2003	Alfonso Benjamin Amparan	10011341-1	1669

7590 02/09/2007
AGILENT TECHNOLOGIES, INC.
Legal Department, DL429
Intellectual Property Administration
P.O. Box 7599
Loveland, CO 80537-0599

EXAMINER

WANG, CLAIRE X

ART UNIT	PAPER NUMBER
----------	--------------

2624

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/603,109

Applicant(s)

AMPARAN ET AL.

Examiner

Claire Wang

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/24/2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3, 13 and 19 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-12, 14-18, 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 1, 2, 8, 11, 12 and 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Eenoboom et al. (US 5078,599) in view of Bilodeau et al. (US 5,465,152).

As to claim 1, Eenoboom et al. (from this point forward will be referred to as Eenoboom) teaches a method of topographically mapping a surface (method of inspecting a dental model; Col. 1, lines 53-54), comprising: directing a radiation beam (laser light source, 12) toward a target location on the surface (dental model, 11). Eenoboom further teaches identifying a peripheral point of the beam spot image (the shape and the general dimension of the spot is calculated through a grid and the direction of its major axis; in order to know the general dimensions of the beam spot it is essential to find the boundary or the peripheral of the beam spot, and since the beam spot has an edge, any point on the edge of the beam spot is a peripheral point); and assigning a relative height value (the beam spot can be moved and used to measure

the height and width of the teeth; Col. 2, lines 2-6) to the target location based on a mapping of the at least one image plane coordinate identified for the peripheral beam spot point to the relative height value (by finding the spot dimensions using a grid system it is possible to determine the inclination of the tooth; Col. 3, lines 13-18).

However, Eenoboom does not teach capturing an image of a beam spot at a location in an image plane intersecting at least a portion of the radiation beam reflected from the target location on the surface or determining at least one coordinate in the image plane corresponding to the identified peripheral point.

Bilodeau teaches capturing a beam spot with optics (Col. 3 line 64), where the beam spot is located in an image plane intersecting at least a portion of the radiation beam reflected from the target location of the surface (Fig. 4). Thus the capturing a beam spot with optics and placements of image plane of Bilodeau reads on the claimed capturing an image of the beams spot and the image plane configuration. Also, Bilodeau discloses the light sensors give the location of the beam spot (Col. 3 lines 64-67; Col. 4 lines 4-6). Thus the location of the beam spot of Bilodeau reads on the claimed finding the location of the peripheral point since the peripheral point is a point within the beam spot, it is then logical to know the location of the peripheral point. Therefore, it is obvious to one ordinarily skilled in the art at the time of the invention to combine the dental model inspection system using a beam spot to determine the dimensions of teeth with optics inspection system using a beam spot in order to more accurately determine the dimensions of the object being inspected.

As to claim 2, Bilodeau teaches wherein the radiation beam is directed along a beam axis (see beam coming out from light source 14 along the z-direction; Fig. 4) and an image plane coordinate (Col. 3 lines 64-67) is identified with respect to a first direction substantially parallel to a projection of the beam axis onto the image plane (Fig. 4).

As to claim 8, Bilodeau teaches wherein the surface forms a boundary of a substrate (17) and is semitransparent (partially transparent; Col. 4 lines 23-24) with respect to the radiation beam.

As to claim 9, Bilodeau teaches wherein the substrate is a printed circuit board (Col. 2 lines 65-67).

As to claim 11, it is the system claim of claim 1. Note the discussion above.

As to claim 12, it is the system claim of claim 2. Note the discussion above.

As to claim 18, it is a computer program (the calibrated processing electronics (13) are used to calculate the height and store the height with its associated target location. A computer program must be present in order for this process to be completed; Bilodeau Col. 4 lines 7-9) of claim 1. Note the discussion above.

3. Claims 4, 5, 6, 7, 9, 10, 14, 15, 16, 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bilodeau in view of Eenoboom as applied to claims 1, 2, 8, 11, 12 and 18 above further in view of Svetkoff et al. (US 5,812,269).

As to claim 4, Bilodeau teaches identifying a peripheral point on a beam spot, however both Eenoboom and Bilodeau do not teach wherein identifying comprises

Art Unit: 2624

applying a threshold to pixel values of the beam spot image to identify the peripheral point. Svetkoff teaches of applying threshold in a triangulation-based system to inspect solder joints using laser spot (Svetkoff Col. 7 lines 17-24). Therefore, the method of applying threshold to laser spot reads on the claimed applying a threshold to pixel values. It would have been obvious to one ordinarily skilled in the art to combine Bilodeau's image plane with Svetkoff's threshold because applying the threshold can optimize the estimation for different imaging and measurement applications (Svetkoff Col. 7 lines 17-24).

As to claim 5, Svetkoff teaches matching of gray scale with height data. Where the gray scale values are within a pre-set threshold (Svetkoff Col.12 lines 28-33). (Svetkoff Col. 7 lines 44-46). Therefore, Svetkoff's gray scale threshold reads on the claimed "grayscale threshold". Thus, it would have been obvious to one ordinarily skilled in the art to combine Svetkoff's gray scale threshold with Eenoboom's image plane because it allows the 3D imaging and processing to be more reliable (Svetkoff Col. 7 lines 41-46).

As to claim 6, Svetkoff teaches after the gray scale value is within a predetermined threshold value then uses the gray scale value to have access to a look-up table that contains one-to-one correspondence for z-data, or height value (Svetkoff Col. 11 lines 58-62). This reads on the claimed "predetermined relative height value". Therefore, it would have been obvious to one ordinarily skilled in the art to combine Svetkoff's look-up table with Eenoboom's image plane because it allows easy access to pre-load decision rules with little impact on processing time (Svetkoff Col. 12 lines 1-5).

Art Unit: 2624

As to claim 7, Svetkoff teaches after the gray scale value is within a predetermined threshold value then uses the gray scale value to have access to a look-up table that contains one-to-one correspondence for z-data, or height value (Svetkoff Col. 11 lines 58-62). This reads on the claimed "lookup table". Therefore, it would have been obvious to one ordinarily skilled in the art to combine Svetkoff's look-up table with Eenoboom's image plane because it allows easy access to pre-load decision rules with little impact on processing time (Svetkoff Col. 12 lines 1-5).

As to claim 14, it is the system of claim 5. Note the discussion above.

As to claim 15, it is the system of claim 4. Note the discussion above.

As to claim 16, it is the system of claim 6. Note the discussion above.

As to claim 17, it is the system of claim 7. Note the discussion above.

As to claim 20, it is the computer program (the calibrated processing electronics (Bilodeau 13) are used to calculate the height and store the height with its associated target location. A computer program must be present in order for this process to be completed; Bilodeau Col. 4 lines 7-9) of claim 4. Note the discussion above.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bilodeau et al. Eenoboom et al. and Svetkoff et al. as applied to claims 1, 8-9 above, and further in view of Roder (US 6,490,368 B2).

As to claim 10, note the discussion of Bilodeau, Eenoboom and Svetkoff above. Both Eenoboom and Svetkoff do not teach Roder teaches of triangular mesh pattern for surface mapping. Roder teaches of laser surface mapping using the form of triangular

Art Unit: 2624

mesh (Roder Figs. 4A-4C) pattern. This reads on the claimed "directing, capturing, identifying, determining and assigning for a plurality of target location on the surface of the printed circuit board arranged in a prescribed triangular mesh pattern." Therefore, it would have been obvious to one ordinarily skilled in the art to combine Bilodeau's mapping system as modified by Eenoboom and Svetkoff with Roder's triangular mesh pattern mapping because it is used to help to better identify the objects being examined (Roder Col. 16 lines 9-17).

Allowable Subject Matter

5. Claims 3, 13 and 19 are allowed. The following is a statement of reasons for the indication of allowable subject matter:

Claims 3, 13, and 19 are deemed allowable because of identification of the peripheral point on the beam spot by selecting the peripheral point that is physically closest to the beam axis.

Response to Amendment

6. Applicant's arguments with respect to claims 1-2, 4-12, 14-18 and 20 have been considered but are moot in view of the new ground(s) of rejection.

7. Regarding the claim objections to claims 12 and 20, applicant's amendments are sufficient to overcome the objections.

Art Unit: 2624

8. Regarding the 35 U.S.C. 112 first paragraph rejection of claims 3,13 and 19, applicant's arguments are persuasive and the rejection is withdrawn.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

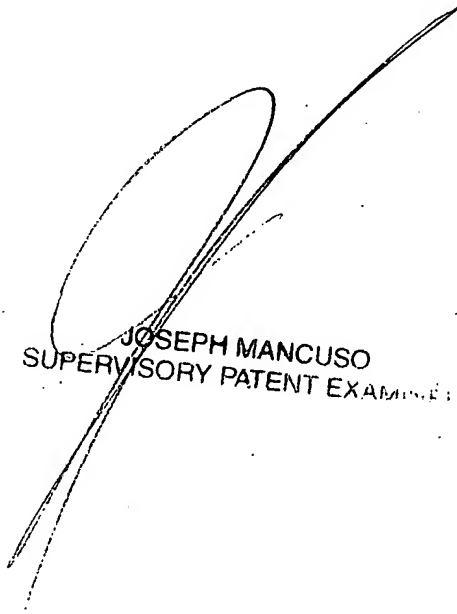
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Claire Wang whose telephone number is 571-270-1051. The examiner can normally be reached on Mid-day flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on 571-272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2624

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Claire Wang
02/02/2007



JOSEPH MANCUSO
SUPERVISORY PATENT EXAMINER